

U. S. Department
of Homeland Security

**United States
Coast Guard**



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U. S. Coast Guard
Research and Development Center

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Attn: Heather Baird, Vice President of Corporate Communications

DEEPWATER HORIZON RESPONSE BAA HSCG32-10-R-R00019, TRACKING #2004044

We are pleased to inform you that the initial screening of your White Paper submitted under Broad Agency Announcement(BAA) HSCG32-10-R-R00019 has been completed. It has been determined that your White Paper submission has a potential for benefit to the spill response effort.

Your White Paper has been forwarded to the Deepwater Horizon Response Federal On-Scene Coordinator (FOSC) for further action under its authority. Subject to the constraints and needs of the ongoing oil spill response, you may be contacted by the FOSC or the responsible party.

As identified in the BAA, there is no guarantee of a contract award.

We appreciate your interest in supporting the Deepwater Horizon Response effort.

Contracting Officer /s/
USCG R&D Center

Research Opportunity Number

Broad Agency Announcement (BAA) HSCG32-10-R-R00019

Amendment 0002

Research Opportunity Title

Deepwater Horizon Response

Program Name

Interagency Alternative Technology Assessment Program (IATAP)

Technology Gap #3

Traditional Oil Spill Response Technologies

(“Innovative applications not commonly used for oil spill response”)

Presented by

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ABOUT MICROSORB: We specialize in environmental solutions for open water and land-based hydrocarbon spills. At our core is a microbial technology, the Oppenheimer Formula, (Formula), which has been listed on the EPA NCPPL since 1991. MicroSorb has built extensive field experience over the last 20 years utilizing our non-toxic microbial technology.

WHY IS BIOAUGMENTATION NOT USED IN THE GULF: The USCG and the USEPA have not yet authorized the use of microbes in the Gulf Spill based on USEPA science, particularly the report Bioremediation of Spilled Crude Oil on Fowler Beach, Delaware. In this experiment, cultures of existing microbes were taken from the vicinity, grown on crude oil, then reintroduced as bioaugmentation. A beach was oiled and 3 plots were created: a control, nutrients only, and reintroduced microbes with nutrients. After 10 weeks, degradation was labeled equal.

Following extensive testing on the Oppenheimer Formula, very different conclusions about bioaugmentation were reached. There are several concerns regarding the EPA Delaware test. First, none of the microbes on the EPA NCPPL list were tested. The reintroduced microbes were likely substandard versus those on the NCPPL. Conclusions regarding the efficacy of an entire spill cleanup category were made without testing approved formulations. Second, neither the indigenous nor redeployed microbes were type classified. After 10 weeks, the tide changes and currents would have allowed all microbes, both indigenous and reintroduced, to migrate between all sites, rendering all plots equivalent. We have experienced this in experiments detailed below.

PROOF OF BIOAUGMENTATION WITH THE OPPENHEIMER FORMULA:

Ex 1: DEEPWATER HORIZON LAB TEST: A sample of the crude oil and water from Plaquemines Parish, LA was secured in May 2010 and tested with our Formula at an independent lab in Austin, TX. In less than 24 hours, greater than 90% of the oil was destroyed.

Ex 2: OPEN WATER: Our Formula has been used in the Gulf following the release of heavy oil from the tanker Mega Borg in Texas in 1990. The State of Texas endorsed our

bioaugmentation process and even created a film based on the successful results of the MegaBorg.

The film and other documentation is available for review at www.microsorb.org.

Ex 3: OPEN WATER: When the tanker Nakhodka sank off the Japanese Coast, our Formula was applied and an extensive study conducted by University of Kumamoto. This bioaugmentation study is the most complete to-date in an ocean environment. The conclusions show that bioaugmentation using our Formula is superior to natural attenuation.

Ex 4: WETLAND TEST, PEER REVIEWED: MicroSorb applied microbes to a release of kerosene in a sensitive wetland where all vegetation was dead. Before application, both the indigenous microbial population and our microbes were typed. The site was divided into three plots: control, nutrients only and nutrients plus our microbes. In 45 days our microbes were found throughout the entire site, not just the plot in which they were applied. This demonstrates their ability to thrive and migrate throughout their environment. Contamination was quickly and vastly reduced. This study was presented at a Batelle Institute conference in Italy, providing peer review of the test method and conclusions of the efficacy of our Formula.

OTHER NOTABLE APPROVALS: Our Formula was successfully used by BP for oil remediation in Lake Michigan. Our formula has also been used in Italy, Greece and Japan.

WHY THE FORMULA IS EFFICACIOUS: MicroSorb is a proprietary blend of nature's most powerful oil eating microbes, harvested from some of the most extreme & oil prone environments around the globe. Our microbes are cultivated on Texas sweet crude oil and Gulf of Mexico seawater as a food source so they are ideally suited for the Deepwater Horizon. Some of our microbes are aerobic and some are anaerobic, so they can function in oxygen rich areas as well as oxygen depleted zones. In order to have hyper-degradation occur, there must be 1 mil oil-degrading microbes per gram of contaminant. The more hydrocarbon degrading microbes present at the site of

the spill, the faster the cleanup. Our formula has 10 billion microbes per gram and the population doubles every 20 minutes. It is non-toxic, non-pathogenic and never genetically altered.

HOW TO APPLY MICROSORB IN THE GULF SPILL: We can train local teams of fisherman, firefighters and Coast Guard personnel and our solution is scalable. MicroSorb microbes can treat all phases of oil we have observed in the Gulf – they include:

1. *A mass of heavy crude oil on water surface.* These will be broken-up physically by boats using pumps and high-pressure hoses. Combine our Formula with seawater and spray on the plume. The pressure from the hoses breaks up the oil and brings oxygen and water to the microbes, allowing them to efficiently degrade the now broken-up oil masses. These vessels will be slow moving, attacking one area of contamination at a time.

2. *Oil slicks or oily sheens,* widely dispersed along the surface of the water. We will use trolling vessels covering large areas in a short period of time, spraying microbes where they travel via hoses. Bioremediation will be rapid and will begin as when the microbes hit the water's surface.

3. *Subsurface tarballs/plumes of crude oil:* Best treated using the Biofence™ (patent pending) technology. Biofence is the injection of air and microbes into the water. (Biofence is also submitted separately under #4 of the IATAP) and further information is available upon request.

4. *Oil permeating marshlands.* These can be remediated utilizing our Biofence™ technology. Oxygen and microbes can be applied to these areas by boat without damage – no excavation needed.

Application Rates and Available Product: In open-ocean, the Formula is applied at 1,000 lbs p/sq mile. (Boats breaking up masses of floating crude will use more). Boats applying the microbes to an oily sheen may apply 1 lb of microbes per 50 ft by 500-1,000 ft strip. In wetlands, 1 lb of the Formula should be mixed with 50 gals of seawater and sprayed on. This application may be as little as 1 pound per 200 sq ft.

Initially, 40 to 60 tons per week are available. Capacity can be increased when necessary.